Environmental Justice Assessment
Arizona Clean Fuels Yuma, LLC
Petroleum Refinery
Near Tacna, Arizona
Air Quality Control Permit # 1001205
January 31, 2005

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1.0 Introduction - Purpose of Assessment

This Environmental Justice (EJ) Assessment has been prepared in consideration of the ADEQ licensing decision for a petroleum refinery air quality permit application received from Arizona Clean Fuels Yuma, LLC, to construct and operate a refinery near Tacna, Arizona. This licensing decision solely addresses the air emissions of the proposed refinery. Further applications must be undertaken by Arizona Clean Fuels Yuma, LLC, if the refinery has any regulated waste or water requirements. The location of this facility is shown in Appendix B, Figure B-1.

Since ADEQ receives federal financial assistance, ADEQ's licensing decision is subject to Title VI of the Civil Rights Act, 42 U.S.C. §2000d et seq[1]. ADEQ has complied with 40 CFR 7.30, 7.35 and 7.15 to the extent permitted by law. ADEQ has committed to seek out and be responsive to community concerns regarding public health and the environment, including all claims of inequity due to environmental impacts.

Data from this report has been drawn from the ADEQ published reports and other sources provided in Appendix A. ADEQ compared data near the proposed refinery with various reference areas within the state. ADEQ has aligned this assessment with components of U.S. EPA Region II Guidance on Environmental Justice; U.S. EPA Region V Guidelines on Environmental Justice; Executive Order 12898, published on February 11, 1994[2]; and U.S. EPA's Draft Title VI Guidance for U.S. EPA Recipients Administering Permitting Programs, published on June 27, 2000 in the Federal Register.

ADEQ does not believe that issuance of the Air Quality Permit for the Arizona Clean Fuels Yuma petroleum refinery is a violation of Title VI. As discussed herein, utilizing the criteria put forth by U.S. EPA for evaluating environmental justice claims, ADEQ concludes that there is no disparate adverse treatment of or disparate adverse impact on the Tacna area community from this facility. Moreover, the potential impact has been minimized by the substantial mitigation requirements included in the air quality permit. ADEQ's assessment focused on the potential impact on the residents who live closest to the refinery. ADEQ ambient air modeling demonstrated that the population that is affected by the refinery's operations is located within 4.5 miles of the refinery and that the air emissions impacts diminish rapidly with distance. By ensuring that there is no disparate treatment of or disparate impact on the community that is located within 4.5 miles of the refinery, ADEQ has also ensured that the communities of Mohawk, Roll, Wellton, and Yuma, that are further than five miles away from the refinery, also are not subjected to any disparate adverse impact as a result of the licensing decision.

[1] 42 U.S.C. § 2000d , Title VI, states "No person in the United States shall, on the ground of race, color, or national origin, be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any program or activity receiving Federal financial assistance." Program or activity is further defined in 42 U.S.C. §2000d 4a

[2] "[t]o the greatest extent practicable and permitted by law, and consistent with the principles set forth in the report on the National Performance Review, each Federal agency shall make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations in the United States..."

2.0 Characteristics of the Community Near the Proposed Refinery Site

2.1 Observations, Zoning and Recent Historical Information

The proposed Arizona Clean Fuels Yuma petroleum refinery would be located approximately 5 miles east of the community of Tacna, 6 miles west of the community of Mohawk, 7.5 miles southeast of Roll, 16 miles east of the Town of Wellton, and 40 miles east of Yuma, along Interstate 8, near the intersection of Avenue 44 E and Old Highway 80. The proposed refinery property comprises approximately 1,450 acres of land to be purchased from the Wellton-Mohawk Irrigation District.

Figure B-2 in Appendix B is an aerial photo of the vicinity and surrounding area in which the refinery is proposed, showing that the area is largely agricultural. The proposed refinery site property is not currently being utilized.

Traditional land use in the Tacna region has been largely agricultural in nature. Farming, cattle raising, tourism, and two military bases, US Marine Corps Air Station and US Army Yuma Proving Ground are Yuma County's principal industries. Yuma County is best known for its agricultural methods using irrigated desert land to grow lettuce and other crops.

2.2 Demographics

ADEQ has relied on 2000 U.S. Census data to assess the demographics of the communities near this proposed facility. In evaluating whether a community is a potential environmental justice community, ADEQ has utilized, in part, criteria developed by U.S. EPA Region V in their Environmental Justice Assessment Guidelines. The Region V criteria state that if the low income population or minority population percentage is greater than twice the state percentages, the case should be identified and addressed as an EJ case. Region V concluded that if the low income population or minority population percentage is less than twice but greater than the state percentages and if there are community-identified EJ issues, the case should be identified and addressed as a potential EJ case. Region V also concluded that if the low-income population or minority population percentage is equal to or less than the state percentages, the case should not be considered an EJ case.

For this case ADEQ has utilized Region V's criteria in part. First, ADEQ concludes that if the minority population of the affected area is greater than twice the state percentages, the case should be identified and addressed as an EJ case. Second, if the minority population is less than twice, but greater than the state percentages, and if there are community-identified EJ issues, the case should be identified and addressed as a potential EJ case. Third, if the minority population percentage is equal to or less than the state percentages, the case should not be identified and considered an EJ case.

Table 1 below shows the demographics for the community surrounding the proposed refinery, as well as the county and state averages. The minority population percentage for the Tacna area community falls above the state average and less than twice the state average and there may be environmental justice issues. Therefore ADEQ concludes that the community is a potential environmental justice community.

Table 1: A Comparison of Demographic Data Near the Petroleum Refinery Site

Location		*Distance (radius) in miles*	*Number of People*	*% Minority*[1]	*% Sensitive Population*[2]
ACF Refinery Site, Near Tacna, Arizona	ROI affected population[3]	4.5	189	42.3%	21.7%
	Most affected population[4]	2	84	57.1%	22.6%
	Most affected permanent population[5]	2	67	46.3%	22.4%
Yuma County, AZ		N/A	160,026	55.6%	24.5%
State of Arizona		N/A	5,130,632	36.2%	20.4%

2.3 Minority Population

The minority composition percentages are shown in Table 1. For the purposes of determining whether the affected community is a minority community, three possible populations can be defined. Data were gathered for these three possible communities:

a) All people in the 103 census blocks that are at least partially within the 7.5 km (4.5 mi.) radius of impact. This group includes 189 people and is hereafter referred to as "ROI affected population."

b) All people in the 31 census blocks that are at least partially within a 2 mile radius. This group includes 84 people and is hereafter referred to as "most affected population."

c) All people within the most affected population, but excluding the people that, at the time of the 2000 census, resided on what would be the refinery property. This group includes 67 people and is hereafter referred to as the "most affected permanent population."

[1] Comprises all Hispanic ethnicity (including White individuals of Hispanic ethnicity), Black or African American alone, American Indian and Alaskan Native alone, Asian alone, and Native Hawaiian and Other Pacific Islander alone: Source: P7 Data Set: Census 2000 Summary File 3 (SF 3) - Sample Data

[2] The total population less than or equal to 5 years of age, or greater than or equal to 65 years of age.

[3] All people in the 103 census blocks that are at least partially within the 7.5 km (4.5 mi.) radius of impact. This group includes 189 people.

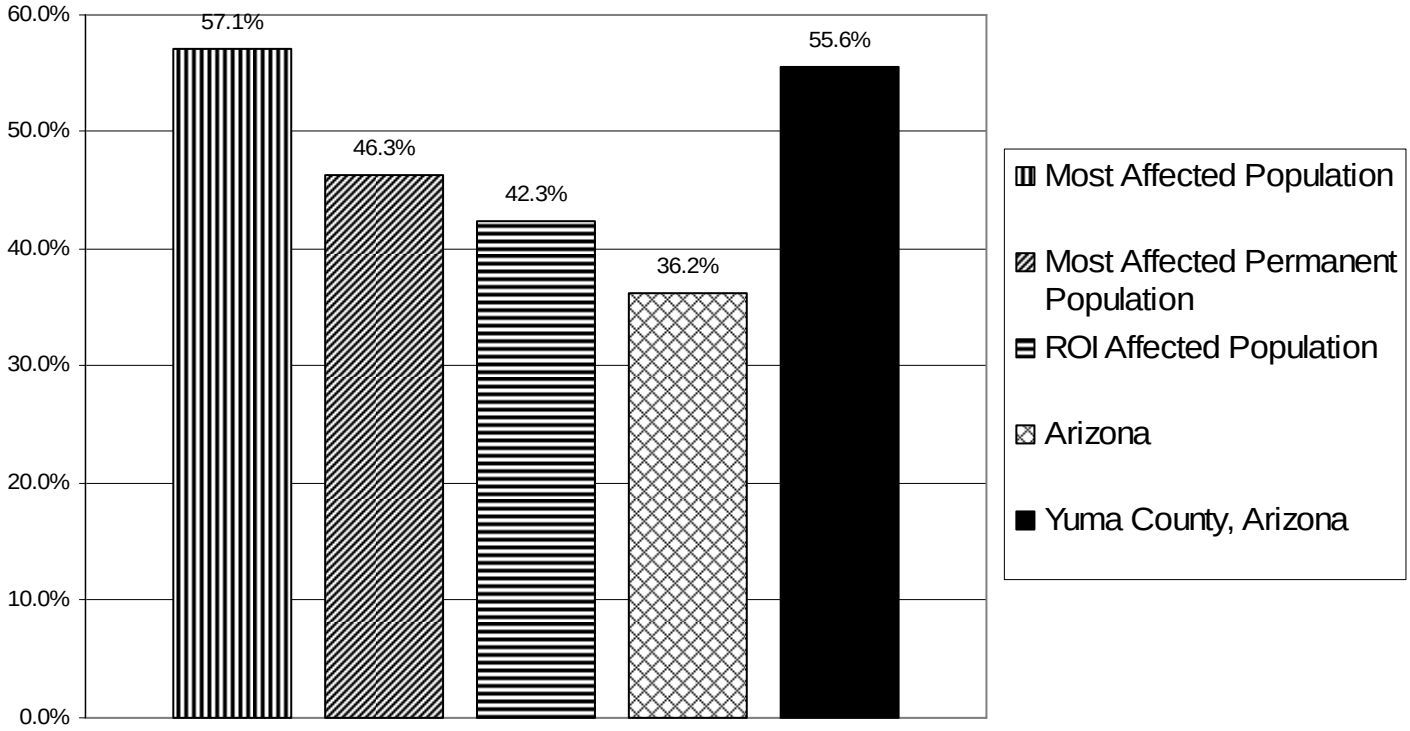
[4] All people in the 31 census blocks that are at least partially within a 2 mile radius. This group includes 84 people.

[5] All people within the most affected population, but excluding the people that, at the time of the 2000 census, resided on what would be the refinery property. This group includes 67 people.

For all comparisons, it has been assumed that "minority" includes all people other than those who are both white and non-Hispanic. As shown in Figure 1, the affected community has a higher percentage of minorities than the reference population if the entire state is used as the reference population (regardless of how the affected community is defined), or if the "most affected population" (including residents of the refinery site) is used as the affected community.

It must therefore be concluded that the affected community is a minority community and, under the U.S. EPA Region V criteria, the case would be identified as a potential EJ case.

Figure 1. Percent Minority by Population



2.4 Sensitive Population

Sensitive populations are generally defined as those in the general population that may be more affected by pollution. ADEQ has identified children under five years (5) and adults over sixty five (65) as sensitive populations for this assessment.

By this standard the affected community is considered a sensitive population compared with the State of Arizona (20.4%). The affected sensitive population is less than twice the state average but greater than the county and state percentages. Thus, under the U.S. EPA Region V criteria the case would be identified as a potential EJ case.

3.0 Summary of Air Quality

The air quality impact analysis showed that the refinery will not cause or contribute to a National Ambient Air Quality Standard (NAAQS) or Arizona Ambient Air Quality Guideline (AAAQG) exceedance. A complete review of the ambient air quality analysis can be found in Section VII of the Technical Support Document that accompanies Air Quality Permit # 1001205.

The Department also compared the air pollutant exposure of the affected community to that of the reference population, using readily available air quality and air emissions data for the area near the refinery site and for Arizona as a whole[1]. Based on this review, the affected community is exposed to much less adverse impacts than the state as a whole:

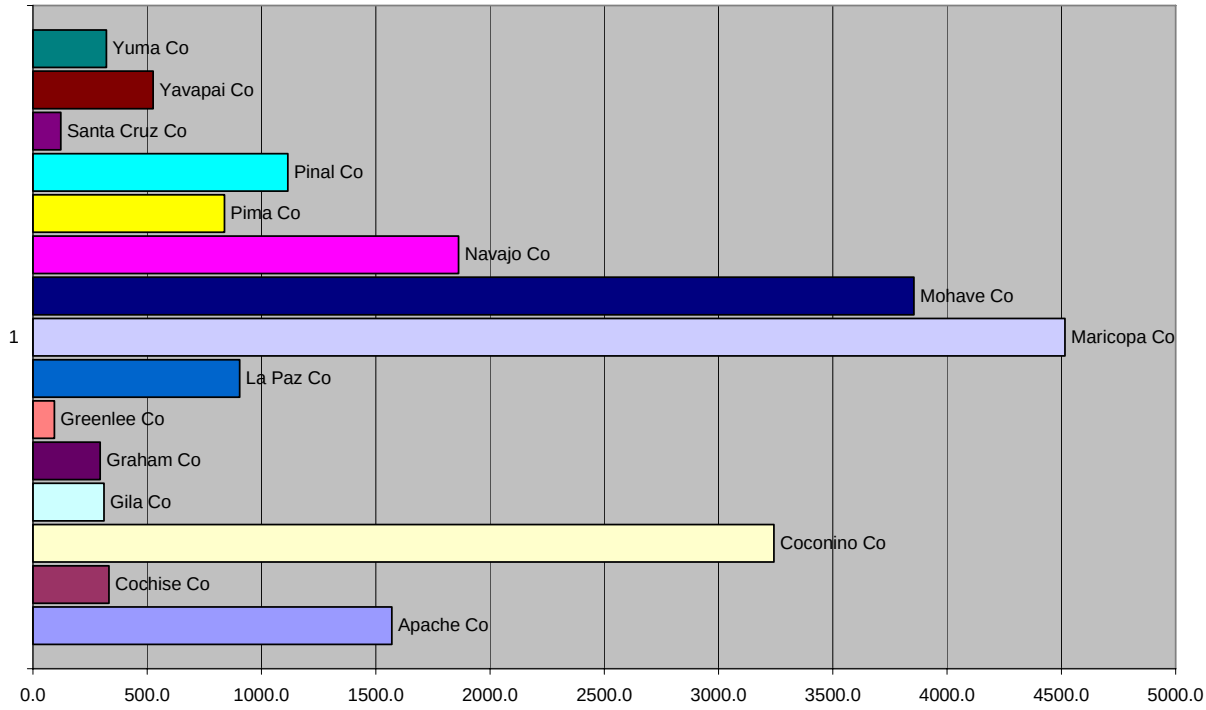
a) Based on ambient air quality, the affected community is much less exposed than the statewide average. Including the effects of the refinery and other recently permitted facilities, the air quality to which the affected community is exposed is much better than all NAAQS; the statewide "average" is impossible to quantify precisely, but more than half of the state's population lives within the Phoenix ozone nonattainment area, where the concentrations of ozone and other criteria pollutants are much higher than in central Yuma County.

b) Based on criteria pollutant emissions (according to the most recent available U.S. EPA data), the affected community is much less exposed than the statewide average. Without the refinery, total criteria pollutant emissions in Yuma County are about 91,000 tons/yr, including 58,000 tons/yr of CO. With the refinery, these values are 93,000 tons and 59,000 tons, respectively. The emissions density is 6 tons per square mile without CO and 17 tons per square mile with CO. The vast majority of Yuma County's criteria pollutant emissions originate with stationary and mobile sources in or near the city of Yuma, so the affected population actually is exposed to even lower values. For criteria pollutants other than CO, only Coconino, Graham, Greenlee, La Paz, and Mohave counties have lower emissions densities than Yuma County. Only 6% of the state's population lives in these counties; approximately 60% of the state's population resides in Maricopa County, where the emissions density is 43 tons per square mile without CO and 137 tons per square mile with CO.

c) Based on HAP emissions (according to the most recent available U.S. EPA data), the affected community is much less exposed than the statewide average. Total HAP emissions in Yuma County are about 1,500 tons/yr without the refinery and about 1,600 tons/yr with the refinery. The emissions density is 300 pounds per square mile. Only Gila, Graham, Greenlee, La Paz, and Santa Cruz counties have lower emissions densities than Yuma County. Less than 3% of the state's population lives in these counties; approximately 60% of the state's population resides in Maricopa County, where the emissions density is 4,500 pounds per square. (See Figure 2)

[1] Readily available data refers to the information gathered from the TRI database, U.S. EPA - AirData Facility Emissions Report - Hazardous Air Pollutants, and the U.S. EPA Air Facility Subsystem (AFS).

Figure 2. HAP Emissions Density by County
(lbs/mi^2)



4.0 Potential Environmental Impacts

Figure B-5 in Appendix B is a map of known regulated facilities near the Tacna area. As the figure clearly shows, there are no other significant concentrations of regulated facilities in the vicinity.

4.1 Environmental Impacts from Regulated Facilities

The following types of regulated facilities were identified for inclusion in Figure 5 of Attachment B:

Enforcement & Compliance History Online (ECHO) Web site – The U.S. EPA ECHO site allows a person to determine whether compliance inspections have been conducted by the U.S. EPA or State/local governments, if violations were detected and if enforcement actions were taken and penalties assessed in response to environmental law violations. Compliance searches can retrieve data from air, water and hazardous waste cases.

The Web site was queried for Yuma County. Of the eleven (11) facilities returned from the ECHO site none had alleged current significant violations.

National Priorities List (NPL) Web site – The U.S. EPA NPL site is the list of national priorities among the known releases or threatened releases of hazardous substances, pollutants,

or contaminants throughout the U.S. and its territories. From this Web site, a person can locate NPL sites, check their cleanup progress, and get information on new and proposed NPL sites.

The only NPL site in all of Yuma County is the Yuma Marine Air Corps Station, a national defense military installation. The site was proposed for listing June 24, 1988 and was placed on the final listing February 21, 1990. Though located within Yuma County, the installation is located in Yuma city and is over 20 miles from the proposed refinery site and will not contribute to a disparate adverse disparate impact on the refinery's most affected permanent population.

RCRAInfo Web site – The U.S. EPA RCRAInfo site is a national program management and inventory system about hazardous waste handlers. In general, all generators, transporters, storers, and disposers of hazardous waste are required to provide information about their activities to state environmental agencies.

The RCRAInfo site allows a person to retrieve selected data from the Resource Conservation and Recovery Act Information (RCRAInfo) database in Envirofacts by specifying a facility using any combination of facility name, geographic location, and standard industrial classification.

ADEQ investigated facilities in several zip codes around and including the proposed refinery site. Few RCRA hazardous waste facilities are located near the proposed refinery site including a high school, a landfill, machinery rental and leasing facilities, and pesticide and other agricultural chemical manufacturing. Of the few RCRA hazardous waste facilities the most significant manufacturers reflect the agricultural character and produce pesticides and other agricultural chemicals. Even considering these facilities, and as shown by the summary of air quality, there is far less ambient air emissions exposure in Yuma County compared to Arizona as a whole.

Toxic Release Inventory (TRI) Facilities - Businesses are required to report the locations and quantities of chemicals stored on-site to state and local governments in order to help communities prepare to respond to chemical spills and similar emergencies. U.S. EPA and the States annually collect data on releases and transfers of certain toxic chemicals from industrial facilities, and make the data available to the public in the Toxics Release Inventory (TRI). Approximately 670 chemicals and chemical categories were covered by the TRI program in 2003. The threshold quantities for manufacturing or processing are 25,000 pounds per year and 10,000 pounds per year for "otherwise use," unless the chemical is a Persistent Bioaccumulative Toxic (PBT). There are no TRI Facilities within a 5-mile radius of the proposed site, with one exception. The U.S. Marine Corps Barry M. Goldwater Range (a 2.7 million acres section of relatively undisturbed Sonoran Desert) is within 5 miles of the proposed refinery site. However, the Department is unaware of any of the section of the range that is within 5 miles of the refinery location that is used by facilities that have air emissions.

U.S. EPA AirData Web site - The AirData Web site provides access to yearly summaries of United States air pollution data, taken from U.S. EPA's air pollution databases. The AirData Web site has information about air quality emissions for stationary sources regulated by the U.S. EPA and state and local air pollution agencies. AirData is used by some state and local

government agencies to track permit data. There are no AirData Facilities within a 5-mile radius of the proposed refinery site.

4.2 Affected Community Concerns

ADEQ has received several comments from the affected community through the public participation process. ADEQ has prepared a Responsiveness Summary to address these concerns specifically. The majority of comments related to the following areas:

1. *Site Selection*

   There were concerns expressed about the criteria used during the selection of the proposed refinery site.

2. *Project viability*

   There were concerns expressed about the viability of the refinery project.

3. *Control Technology Analysis*

   Concerns were expressed regarding the appropriateness of the Department's determinations of Best Available Control Technology (BACT), including the use of refinery fuel gas (RFG) as a fuel at the refinery. There were also concerns that the Department relied too heavily on economics in its determination of BACT, and that the permit did not contain enough requirements pertaining to the control of hazardous air pollutants.

4. *Air Quality Impact Analysis*

   There was a concern expressed that that the Arizona Ambient Air Quality Guidelines (AAAQG) would be exceeded for twelve pollutants. Additional concern was expressed that the discussion of dispersion modeling results for hazardous air pollutants in the Technical Support Document is not sufficient to inform the public of potential impacts

5. *Secondary Emissions*

   Concerns were expressed regarding emissions increases that may occur at other stationary sources that are built as a direct or indirect result of the construction or operation of the refinery.

6. *Ambient Monitoring and Emission Monitoring*

   Concerns were expressed regarding the adequacy of the permit with regard to ambient monitoring requirements. There were also concerns expressed regarding the adequacy of the permit with regard to emission monitoring.

7. *Health Effects*

Concerns were expressed regarding the effect of air pollutant emissions from the refinery on human health.

8. Odor

Concerns were expressed regarding the odors emanating from the proposed refinery and the effects of those odors on the local residents.

9. Impact on Soils and Vegetation

Concerns were expressed regarding the adequacy of the Department's analysis of the impacts that the refinery's emissions will have on locally grown agricultural crops. Specific concerns were raised with regard to crop losses, human food chain impacts, and danger to livestock.

10. Safety/Security

Concerns were expressed regarding the adverse effects that a spill or emergency release at the refinery might have, particularly on the health and safety of agricultural workers at adjacent farms.

11. Economic Impacts on Other Parties

Concerns were expressed regarding the effect of the proposed refinery on businesses and land value in the local area. Concerns were also expressed that the owners of commercially farmed land adjacent to the refinery will suffer economic losses due to the perception of crop contamination from the refinery.

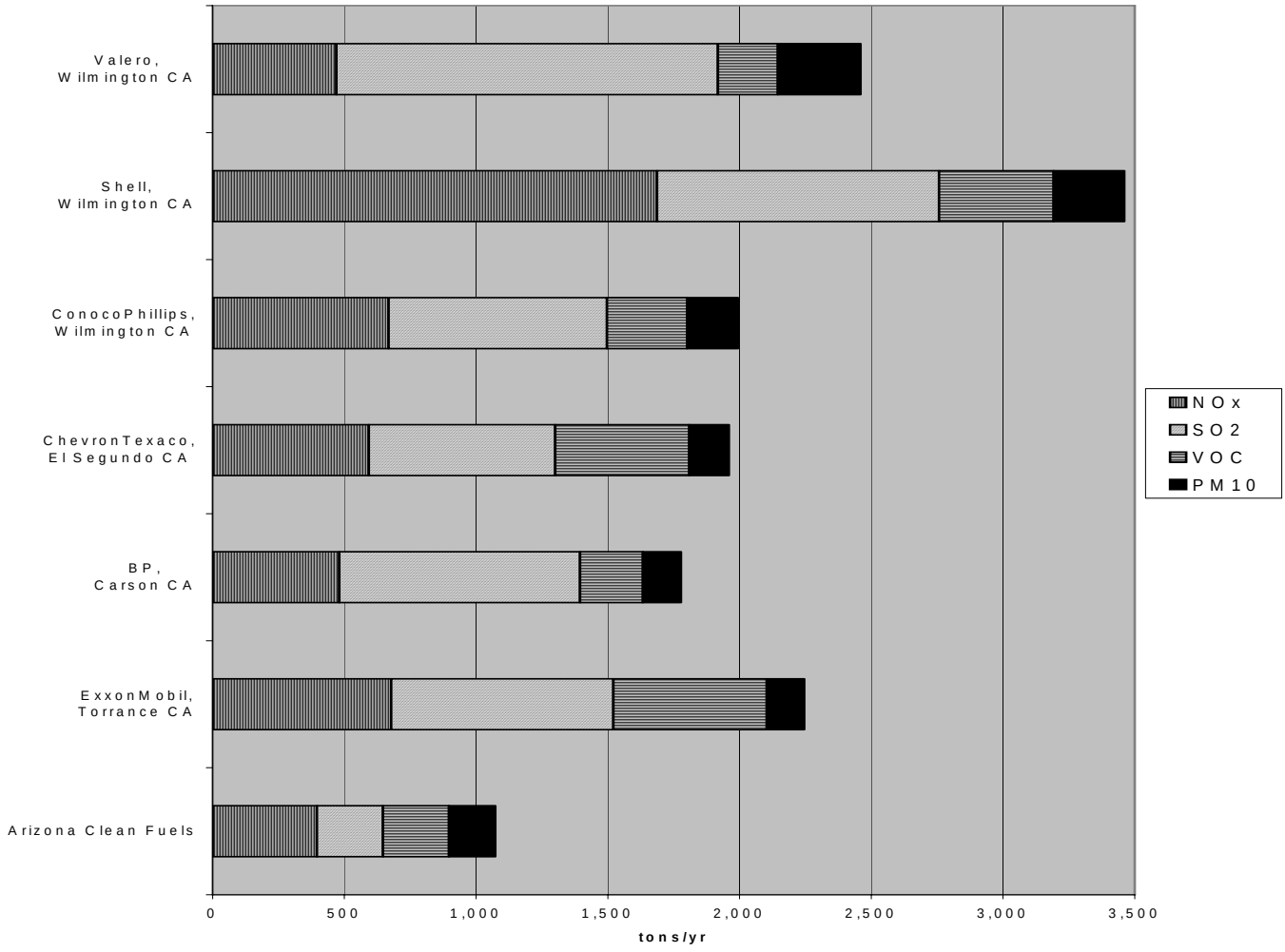
5.0 Conclusions and Analysis

Based on the information reviewed by ADEQ, it has been determined that there is no disparate adverse treatment of or disparate adverse impact on the Tacna area community as a result of the Arizona Clean Fuels Yuma petroleum refinery. ADEQ's assessment focused on the potential impact on the residents who would live closest to the refinery. This is consistent with the air quality dispersion modeling performed by the Department, which showed that the greatest impact would occur at the facility's boundary and that the impacts would diminish rapidly with distance, so that the refinery will have negligible impacts on air quality at all locations more than 4.5 miles away. Thus, by ensuring that there is no adverse impact on the community that are located nearest the refinery, ADEQ has also ensured that the communities of Mohawk, Roll, Wellton, and Yuma, which are more than five miles away from the refinery, also are not subjected to any adverse impact as a result of the licensing decision.

ADEQ's granting of Air Quality Control Permit Number 1001205 does not violate 42 U.S.C. § 2000d or U.S. EPA's regulations (40 CFR 7.30 and 7.35). The air quality permit is technically sound and meets or exceeds all federal and state legal requirements.

In particular, ADEQ concludes that the protections imposed through the air quality permit, ensure that no discrimination against any person in the Tacna area community on the grounds of race, color, national origin or sex will occur. ADEQ finds no discrimination stemming from issuance of the air quality permit because the permit protects air quality from contamination and protects residents from concentrations of air pollutants above the standards and guidelines by a variety of state-of-the-art measures. As required by the PSD rule under Article 4 of A.A.C. Title 18, Chapter 2, the Department made determinations of Best Available Control Technology (BACT) for each emission unit at the refinery and for each pollutant emitted. The process used by the Department in making its BACT determinations starts with a review of the control measures used by other similar sources, including other petroleum refineries nationwide. The Department then establishes emission limits based on the maximum achievable degree of emission reduction, taking into account technical feasibility, environmental impacts, economic impacts, energy impacts, and other costs. For additional information on the BACT determinations made during the permitting process, see Section V of the Technical Support Document for Permit # 1001205. In the case of the Arizona Clean Fuels refinery, the Department's BACT determinations would ensure that this would be, by far, the lowest emitting, fully integrated petroleum refinery in the U.S., as seen by Figure 3.

Figure 3. Refinery Emissions (Arizona Clean Fuels and Los Angeles County Refineries)
Arizona Clean Fuels allowable; others 2002 actual emissions normalized to 150,000 BPD



In addition to these protections under 40 CFR Parts 60, 61, and 63 for New Source Performance Standards (NSPS) and National Emission Standards for Hazardous Air Pollutants (NESHAPs) and A.R.S. § 49-426, Arizona Clean Fuels Yuma, LLC has agreed to undertake the additional measures listed below, which are included in the permit and directly address issues raised by the local community during ADEQ's extensive outreach efforts. Many of these measures are unprecedented in existing refinery facility permits and address community concerns with air quality impacts.

All of these measures are enforceable through the permit approval. The measures include:

A. The proposed air quality permit includes requirements for numerous, state-of-the-art emission control measures that are exceptionally stringent relative to the air quality permits for most petroleum refineries. Examples of these measures include the following:

- The refinery design does not include a fluidized catalytic cracking unit, and the permit does not allow the construction of such unit. Nearly all other petroleum refineries include a fluidized catalytic cracking unit, and this unit is generally the largest-emitting unit at a refinery. The Arizona Clean Fuels petroleum refinery would accomplish the same refining objectives using other technologies, most notably a Hydrocracker Unit.
- The refinery design does not include any alkylation processes that require the use of hydrofluoric acid or sulfuric acid as catalysts, and the permit does not allow the construction of such processes. Most other petroleum refineries include these types of alkylation processes, which are potential sources of toxic chemical releases. The Arizona Clean Fuels petroleum refinery would accomplish the same refining objectives using other technologies, most notably the Butane Conversion Unit.
- The permit prohibits the use of flares as pollution control devices for intermittent or routine, nonemergency hydrocarbon releases. Most other petroleum refineries do currently use elevated flares for this purpose. This commonly results in visible exposed flames, excessive VOC and CO emissions, and difficulty in monitoring and tracking air pollutant emissions. As with all petroleum refineries, the Arizona Clean Fuels refinery would include flares for the safe disposal of gases released during emergencies.
- The permit prohibits the combustion of fuel oil in the refinery's boilers and heaters. Natural gas and fuel gases generated within the refinery are the only fuels allowed. Most petroleum refineries do burn fuel oil, which results in higher emissions of several air pollutants.
- The permit requires highly efficient removal of sulfur from fuel gas burned in the refinery's process heaters, so that the sulfur concentration is maintained at or below 35 parts per million by volume. This would be nearly 80 percent lower than the applicable emission standards for most other petroleum refineries, and the Department is not aware of any other petroleum refinery that is required to achieve a limit that is this stringent.
- The permit requires the use of ultra-low-NO_x-burners (ULNB) for control of NO_x emissions from all boilers and heaters. Nearly all petroleum refineries have at least some boilers and heaters that are not so equipped.
- The permit requires the use of selective catalytic reduction (SCR), in addition to ULNB, for control of nearly three-fourths of the residual NO_x emissions. In other words, SCR is required for process heaters that comprise nearly three-fourths of the refinery's total heat

input capacity. Most refineries are not required to employ SCR systems for NO_x control on any boilers or process heaters.

- The permit limits ammonia emissions from the SCR-equipped process heaters to a maximum concentration of 5 parts per million by volume. The Department is not aware of any other petroleum refinery or similar facility that is required to achieve a limit that is more stringent.
- The permit requires highly efficient recovery of sulfur from refinery waste streams, with a design efficiency level of more than 99.97 percent and an SO_2 emission limit of only 33.6 pounds per hour. The Department is not aware of any other petroleum refinery that is required to achieve a limit that is this stringent.
- The permit requires the refinery to meet several equipment design standards and work practice requirements in order to minimize SO_2 emissions during upsets and malfunctions of the sulfur recovery process. These measures include a requirement to curtail operations and to divert sulfur-containing streams in order to eliminate excess emissions within 15 minutes after the beginning of a process upset, and requirements for excess capacity sufficient to allow the refinery to operate for at least 24 hours during such an upset without further excess emissions. The Department considers this to be an important element of the refinery's design and a focus of the BACT analysis because, in the absence of such measures, the refinery could emit SO_2 at a rate approaching 75 tons per hour during upsets and malfunctions. (This is more than 4,000 times the maximum allowable SO_2 emission rate of 33.6 pounds per hour during normal operations.) The Department is not aware of any other petroleum refinery that is required to meet requirements that are this stringent.
- The permit requires the use of gas compression for recovery and in-process recycling of hydrocarbon vapors from selected hydrocarbon liquid storage tanks. This configuration would result in near-zero emission rates for the affected tanks. The Department is not aware of any other petroleum refinery that is required to employ this equipment configuration.
- The permit requires the use of floating roofs in tandem with a thermal oxidizer for control of VOC emissions from other selected storage tanks. This configuration would result in low emission rates for the affected tanks. The Department is not aware of any other petroleum refinery that is required to employ this equipment configuration.
- The permit requires the use of thermal oxidizers for control of VOC emissions from each vessel within the refinery's Wastewater Treatment Plant. The permit requires that this thermal oxidizer be designed for at least 99.9 percent VOC destruction efficiency, and also requires that a minimum operating temperature and residence time be maintained continuously in order to ensure the maximum feasible degree of VOC destruction at all times. The Department is not aware of any other petroleum refinery or similar facility that is required to achieve such a high level of VOC emission reduction.
- The permit requires the use of carbon adsorption systems for control of VOC emissions from all drains and sumps within the refinery's wastewater collection system. The permit also requires that each system include two carbon canisters in series in order to ensure the maximum feasible degree of VOC reduction at all times. The Department is not aware of any other petroleum refinery or similar facility that is required to achieve a higher level of VOC emission reduction.
- The permit requires the use of vapor recovery in tandem with thermal oxidizers for control of VOC emissions from gasoline loading into tank trucks and rail cars. This

would result in 99.99 percent control of VOC emissions. The Department is not aware of any other petroleum refinery or similar facility that is required to achieve as high a level of VOC emission control.

- The permit requires the use of thermal oxidizers for control of VOC emissions from loading of diesel fuel and aviation jet fuel into tank trucks and rail cars. The permit requires each of these thermal oxidizers be designed for at least 99.9 percent VOC destruction efficiency, and also requires that a minimum operating temperature and residence time be maintained continuously in order to ensure the maximum feasible degree of VOC destruction at all times. The Department is not aware of any other petroleum refinery or similar facility that is required to employ this equipment configuration or to achieve such a high level of VOC emission reduction.
- The permit requires the use of low-NO_x burners to minimize emissions of NO_x from thermal oxidizers used to control VOC emissions, this equipment is state of the art and used in California refineries.
- The permit requires that the refinery implement a thorough and stringent program for preventing VOC emissions by monitoring, detecting, and repairing leaks in equipment such as valves and pumps. More than 60,000 components (individual pieces of equipment) will be subject to these requirements. Although nearly all petroleum refineries are required to implement "Leak Detection and Repair" or "LDAR" programs under federal regulations, the program required by the proposed permit exceeds the requirements of other programs in a variety of ways:
  - More extensive LDAR program applicability: The proposed permit includes LDAR program requirements for flanges and screwed connectors, which represent nearly half of the total number of affected components. The LDAR program requirements at most refineries do not extend to this type of equipment.
  - Lower leak levels: Under the proposed permit, equipment is deemed to be leaking if the measured concentration exceeds 100 parts per million by volume (ppmv) for some types of components and 500 ppmv for all other types. The LDAR program requirements for most refineries do not consider equipment to be leaking until the concentration is 10,000 ppmv, which is 20 to 100 times as high as the limit in the proposed permit.
  - Faster repair requirements: Under the proposed permit, a first attempt at repair is required within 24 hours, and successful repair is generally required within 7 days. The LDAR programs at most refineries only require that a first attempt at repair be made within 5 days and that successful repair be completed within 15 days.
  - Limits on the number of leaking components: Under the proposed permit, repair could be delayed beyond the 7-day period that is generally required, but only to the extent that the number of leaking components is less than a very small percentage of similar components refinery-wide. The LDAR programs at most refineries do not include any such restrictions.
  - More frequent monitoring: The proposed permit requires frequent monitoring of all types of components, regardless of refinery's past achievements with regard to the percentage of leaking components. For example, the proposed permit requires quarterly monitoring of valves, whereas the LDAR programs at most refineries would require only annual monitoring.

- The permit requires that the refinery implement a thorough and stringent program for preventing VOC emissions by monitoring, detecting, and repairing leaks in the refinery's cooling water system. The permit specifies continuous monitoring of all cooling water streams at the Arizona Clean Fuels refinery. The Department is not aware of any other petroleum refinery or similar facility that is required to implement a program for minimizing VOC emissions from cooling towers that is this stringent. Most petroleum refineries are not required to implement any type of LDAR program for the cooling water system, and the few that are generally are require to perform sampling only four times per year. This potentially allows for tremendous quantities of VOC to be emitted from the cooling towers without detection.
- The permit restricts the emergency generator and the emergency fire water pumps to burning only ultralow-sulfur Diesel fuel (Diesel fuel meeting the most stringent sulfur specifications) in order to minimize SO_2 emissions. The Department is not aware of any other petroleum refinery that is required to comply with a restriction that is this stringent.
- The permit requires that the emergency generator and the emergency fire water pumps be designed and equipped with combustion modifications to minimize emissions of NO_x, CO, and PM_{10}. The emission limits in the proposed permit are much more stringent than those imposed on any similar facility.
- The proposed permit includes a dust control plan to ensure that offsite impacts from fugitive dust generating activities, beginning with site clearing activities that precede the construction of the refinery, will be minimized.
- The proposed permit includes exceptionally stringent testing, monitoring, recordkeeping, and reporting requirements that would be adequate to provide assurance of continuous compliance with all emission limits and standards. These requirements include installing and using 50 continuous emission monitoring systems (CEMS); conducting at least 69 annual emission tests (including performance tests and CEMS accuracy tests); monitoring and recording 133 different process and control device operating parameters; and reporting of the results of all required testing and monitoring. The sampling, analysis, and recordkeeping requirements associated with hydrocarbon releases to the emergency flares, in particular, would be more stringent than what is typically required of other petroleum refineries.
- The proposed permit requires the use of an ambient monitoring network for hydrogen sulfide, which will ensure that the Department and the public are aware of any incident involving elevated H_2S concentration off the refinery property.

B. To address various concerns expressed by the public, Arizona Clean Fuels Yuma, LLC will be required to comply with the following new requirements:

- Monitor particulate matter (PM) during construction;
- Incorporate benzene monitoring before, during, and after construction and operation of the refinery.

These provisions are enforceable by ADEQ through the provisions of ARS Title 49 Article 5. Many of the measures listed above have rarely been required by regulators in prior refinery facility permit approvals, but specifically address potential cumulative impact. ADEQ finds that the measures contained in the permit and in the requirements listed above further ensure that the facility operation will not result in the disparate treatment of, and that there will be no disparate impact on, any person in the radius of influence community on the grounds of race, color, national origin or sex.

ADEQ finds that the measures contained in the air quality permit ensure that the facility operation will not result in the disparate treatment of, and that there will be no disparate impact on, any person in the community of Tacna, Mohawk, Wellton, Roll, Yuma, and the surrounding community on the grounds of race, color, national origin or sex.

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APPENDIX A

Resource List

"Guidelines for Conducting Environmental Justice Analysis", Interim Environmental Justice Policy: U.S. EPA Region 2, December, 2000.

"Environmental Justice Guidance Under the National Environmental Policy Act", Council on Environmental Quality: Executive Office of the President, December 10, 1997.
http://www.whitehouse.gov/CEQ/

"Draft Title VI Guidance for U.S. EPA Assistance Recipients Administering Environmental Permitting Programs and Draft Revised Guidance for Investigating Title VI Administrative Complaints Challenging Permits", Environmental Protection Agency (U.S. EPA). Federal Register Vol. 65, No 124. June 27, 2000.

"An SAB Report: Review of Disproportionate Impact Methodologies", Integrated Human Exposure Committee of the Science Advisory Board: Environmental Protection Agency. December 8, 1998.

"Nondiscrimination in programs or Activities Receiving Federal Assistance from the Environmental Protection Agency", Title 40 Code of Federal Regulations Pat 7, Subpart A (40CFR 7.10). Lexis Publishing's Code of Federal Regulations, 2004.

Race/Ethnicity Demographics
Data Set: Census 2000. http://www.census.gov/main/www/cen2000.html

Poverty Demographics
Data Set: Census 2000. http://www.census.gov/main/www/cen2000.html

Sensitive Populations Demographics
Data Set: Census 2000. http://www.census.gov/main/www/cen2000.html

Air Quality Summary Data
Summary of the Air Quality Impact Analysis of the Air Quality Permits Section, Arizona Department of Environmental Quality. December, 2004

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